AMENDMENTS TO THE SPECIFICATION:

Please replace the brief description of the drawings labeled paragraph 0009 with the following paragraph/list:

[0009] Figures 1a, 1b and 1c (herein after referred to as figure 1) show an exemplary reinforcement bracket.

Figures 2a, 2b and 2c show a four inch plastic electrical box with the bracket of figure 1 installed.

Figures 3a, 3b and 3c show a three inch plastic electrical box with the bracket of figure 1 installed.

Figures 4a, 4b and 4c show a three inch metallic electrical box with the bracket of figure 1 installed.

Figures 5a, 5b and 5c show an installation of two identical brackets into two types of electrical boxes.

Figures 6a, 6b, 6c and 6d show an exemplary electrical box with built-in reinforcement.

Figure 7 shows an alternate bracing electrical box with three flanges.

Figures 8a, 8b, 8c and 8d show an exemplary electrical box having flanges and an integrated bracket.

Figures 9a and 9b show an alternate electrical box having reinforcement.

Figures 10a, 10b, 10c, 10d and 10e show another exemplary electrical box with flanges and an insert molded reinforcement.

Figures 11a and 11b show another exemplary reinforced electrical box.

Figures 12a, 12b and 12c show an alternate reinforcing bracket.

Figures 13a, 13b and 13c show an additional alternate reinforcing bracket.

Please place the following paragraphs in the place of the existing paragraphs, each identified by paragraph number:

[0006] Now there are several electrical box types which will support a relatively heavy load, of which several are represented in U.S. patents. A usual type, represented by U.S. Patent No. 6,242,696 utilizes wings attached to the side of the electrical box to attach to a structural member. This type requires installation prior to the installation of a finished ceiling to avoid damage thereto. Another type, represented by U.S. Patent Nos. RE 38,120, 6,107,568, 6,191,362, 6,207,897 and 6,355,883 envisions a ceiling electrical box that attaches to an overhead structural support member from underneath through the use of screws or other fasteners generally driven upward through the top of the box and into the structural member. Those boxes either include a slot fitting the support member, or are designed to fit in a space between the support member and the surface of the finished ceiling. All of those designs have the disadvantage of reduced internal box volume, by which the number of electrical connections and wires is restricted over a common side-mounted nailed electrical box. Another type, represented by U.S. Patent Nos. RE 33,147, 6,098,945, 6,465,736, and 6,595,479 utilizes an extendable rod or other structure fittable between the space between two joists or structural members. This type of electrical box, although avoiding impacts into the volume of the electrical box, carries a number of disadvantages. First, the use of the rod introduces a substantial lever arm; the rod must therefore be fairly heavy to avoid bowing under the fixture load. This type of box is typically constructed of steel or other metal, as the needed plastic supports would be very thick in comparison. These boxes tend are more complex and require more materials and building steps to fabricate. The cost of this type of box tends to be much higher to the end user. A final type, represented in U.S. Patent Nos. RE 34,603 and 6,100,469, utilizes fasteners through a metal electrical box sidewall into the adjacent structural member. This type relies on the strength of the sidewall to avoid the fastener head pulling through the sidewall material under load, and is therefore unsuitable for plastic materials. Furthermore, this type relies on the box structure to resist a downward force, which may place strain on welds and joints. Additonally, fasteners driven in a substantially horizontal direction limit the amount of driving force that can be applied to the fastener and may make installation difficult without specialized tools. And none of these box types provide a method of upgrading a ceiling electrical box to carry additional load.

[0011] Disclosed herein are several brackets useful for reinforcing electrical boxes installed adjacent to a structural member, such as a truss or joist. Shown in figures 1a, 1b and 1c (herein after figure 1) is an example of one particular reinforcment device in the form of a bracket designed for two specific electrical box types, although it might be installed in others. Bracket 11a includes two largely planar portions, 12a and 15a, connected by bend 17a. Planar portion 12a, in this example, forms an interface providing a mating to the top of an electrical box at the inside. The ends of planar portions 12a and 15a are shaped to form an interface to the side of an electrical box at the inside, that interface being shown at 13a and 14a. In this example, ends 13a and 14a provide two interfaces for two specific electrical box types, as will be discussed presently, one interface provided at 13aa and 14aa for a substantially flat electrical box sidewall and another interface at 13ab and 14ab for a screw boss, which are integral in many plastic electrical ceiling boxes. Planar portion 15a provides a strut-like portion providing resistance to a compressive force applied between the top and side interfaces. That strut-like portion functions to at least partially convert a downward force on the electrical box to a horizontal force in the direction of the structural member. In bracket 11a, two fastener features, in this example recesses, 16aa and 16ab (shown 16a in fig. 1b) provide attachment points for screws. Recesses 16aa and 16ab are oriented so that fasteners inserted therein may fasten the bracket 11a through the electrical box sidewall and into an adjacent structural member. In this example, recesses 16aa and 16ab are configured to align fasteners at approximately 60 degrees from the vertical for an electrical box mounted to a vertical structural member surface. This permits the fasteners to be driven into the structural member with a single tool, such as an ordinary screwdriver or hammer, through many electrical box openings. It is preferred that this angle and the position of any fastener features be set so as to permit ease of access to the fasteners using ordinary tools, although other angles or positions may be chosen without departing from the larger scope of the invention. Preferably, the driving force may be directly applied by a tool external to the electrical box, for example a screwdriver or hammer. Recesses 16aa and 16ab may include a substantially cylindrical portion, not shown, for guiding the fastener at a desired angle relative to the bracket. In this example,

recesses 16aa and 16ab provide seats for screws, which recesses are not threaded to provide free movement so that bracket 11a may be brought tightly into a supportive position. A bend 18a is provided near end 14a to orient that end perpendicular to the electrical box sidewall providing for transverse motion by which bracket 11a may be brought more snugly into a supportive position during installation of the bracket.

[0013] Shown in figures 2a, 2b and 2c (herein after figure 2) is a four inch plastic electrical box 20a with bracket 11a installed; figure 2a showing a perspective view through the electrical box opening, figure 2b showing a bottom view, and figure 2c showing a sectional view through axis 1. Electrical box 20a includes an aperture through which access is permitted to manipulate wires inserted into the electrical box and to make connections thereto. Electrical box 20a includes flanges 22a for holding nails 23 in a relative position whereby nails 23 may be driven into a support member to secure the box 20a into position. When bracket 11a is in installed position, top mating interface 12a (not shown) rests against the electrical box top inside surface 26a, while side interface 14aa resting against a flat portion 21a of electrical box sidewall. Screws 24 are driven through bracket 11a and sidewall 21a into the structural member to secure the bracket 11a into installed position.

[0014] Bracket 11a is designed to reinforce two particular box types. Figures 3a, 3b and 3c (herein after figure 3) show a three inch plastic electrical box 20b with bracket 11a intalled therein, with figure 3a showing a perspective view through the electrical box opening; figure 3b showing a view looking at the bottom, and figure 3c showing a sectional view through axis 3. Electrical box 20b also includes flanges 22b for fastening the box 20b to a structural member by way of nails 23. For this box, the installation position of bracket 11a also brings top mating surface 12a (not shown) against electrical box top inside surface 26b. This electrical box 20b includes a boss 25b for insertion of a mounting screw, whereby a fixture may be attached to electrical box 20b. Bracket 11a rests against boss 20b at the side interfaces 14ab and optionally 13ab (not shown). Screws 24 are likewise driven through bracket 11a and sidewall 21b into the

structural member to secure the bracket 11a into installed position.

[0015] The design of bracket 11a permits use in metallic electrical boxes as well. In figures 4a, 4b and 4c a bracket 11a is shown installed into a 3 inch metal-type electrical box 20c, with figure 4a showing a view from the box bottom, figure 4b showing a sectional view through axis 2, and figure 4c showing a perspective view. This electrical box 20c includes alignment wings 22c with holes pre-formed to permit fastening to a structural member with nails, screws, or other fasteners. As in the plastic boxes, bracket 11a mates top mating surface 12a against the top of the electrical box 26c, and also mates side interface 14aa against electrical box sidewall 21c. To secure, screws 24 are driven through bracket 11a and sidewall 21c into the structural member, although pre-drilling of holes through sidewall 21c may be necessary if holes are not formed therein prior to installation.

[0016] Figures 5a, 5b and 5c further illustrates the installation of two brackets of the type shown in figure 1 using two electrical box types; figure 5a showing a view looking up through the bottom of the electrical boxes and at the ceiling, figure 5b showing a sectional view about the axis labeled 4, and figure 5c showing an inverted perspective view (turned upside down for ease of viewing). Ordinary and modern construction utilizes wood structural members, of which one member 30 is shown. Member 30 might be the lower portion of a truss, a joist, or other structural member upon which a ceiling is to be fashioned. Ordinary construction utilizes drywall 31 fastened by nails or screws to structural members, one screw 32 being shown. Also shown are a four inch plastic electrical box 26a of the type of figure 2 and one three inch plastic electrical box 26b of the type of figure 3. Both boxes 26a and 26b are normally installed prior to drywall application to structural member 30 through flanges, one 22b being shown, and nails 23. Drywall 31 is applied afterward, and holes cut therein to provide access to the interior of the electrical boxes. After drywall 31 is installed, access to structural member 30 may be restricted, particularly if there is little or no access space surrounding structural member 30. In other situations access may be inconvenient, for example where structural member 30 is the lower part of a truss

accessible through an attic or other space. A bracket 11a may be installed without direct access to structural member 30 through the interior of the box. The bracket 11a is inserted into the box and placed in proper mounting position, next to the electrical box sidewall adjacent to the structural member. Screws 24, or other fasteners, are then driven through the bracket 11a, the electrical box sidewall 21a or 21b and into the structural member 30. Figure 5b includes a cutout 33 area to show screw 24 clearly.

[0017] An electrical box may optionally have a reinforcing bracket built in. Figures 6a-d (herein after figure 6) show conceptually how this might be done in a metal-type box. Referring to figure 6a, an electrical box 40a is made in an intermediate stage, the box having a top 45, sides, and an unbent flap 41. Electrical box 40a may be fashioned from usual processes for electrical box manufacture, including stamping, pressing, punching, spot welding and other techniques. In this example and prior to this stage, fastener features 42 have been stamped prior to the next step. Those fastener features might be, for example, screw guides, nail guides, or conical or countersunk structures for securing a screw head. In that step, flap 41 is bent as shown in figure 6b, to form a brace 43 and a top interface portion 44 meeting with top 45. Now it is to be understood that this step may actually include several successive steps in which bends are progressively made to flap 41. Figure 6c also shows the completed configuration as seen through the bottom of the box. Figure 6d shows a sectional view through the axis labeled 5. Now although it is not shown, sidewall 46 is preferably pre-punched or drilled with holes for fasteners to pass through when inserted in 42, by which the installer may avoid drilling operations. This electrical box does not include wings or other extra-box support structures, but rather relies on the bracing structure formed by brace 43 and top interface portion 44 to stabilize the attachment of the electrical box 40b to a structural member. Preferably, at least three fastener features are included, as shown, in at least two axes to form a tri-point securement geometry. Electrical box 40b may be considered to be an "old work" or "rework" type box, as it may be conveniently installed to a finished ceiling. To do so, an installer would (1) find an attachable structural member, (2) cut a matching hole in the drywall, paneling, or other wall structure so the electrical

box may be positioned next to the structural member, (3) insert the box and (4) fasten the box to the structural member through fastener features 42.

[0019] Figures 8a, 8b, 8c and 8d (herein after figure 8) show another bracing electrical box 60a having conventional flanges 61 and an integrated bracket 62a, figure 8a showing a perspective view of the box internal space, figure 8b shows a view of the outside of the box looking at the sidewall in adjacency to the bracket, figure 8c shows a bottom view of the box and figure 8d shows a sectional view in the axis marked 6. In this example, bracket 62a is molded out of plastic and integral to the structure of the electrical box. Ribbing 63 may be provided to resist the force applied by fasteners 64 when attached, while minimizing the amount of plastic material needed. This particular electrical box is useful for new installations where access to the structural member is not restricted.

[0020] Shown in figures 9a and 9b is an alternate electrical box 60b showing two different perspective views to the interior of the box. Electrical box 60b has the same integrated bracket 62a and ribbing 63 as box 60a of figure 8, but omits flanges 61. This box may be installed in a similar manner to the box 40a of figure 6, and is considered to be an "old work" type box.

[0021] Figures 10a, 10b, 10c, 10d and 10e (herein after figure 10) show another bracing electrical box 60c having conventional flanges 61 and an insert molded bracket 62b, figure 10a showing a perspective view of the box internal space, figure 10b showing a view of the outside of the box looking at the sidewall in adjacency to the bracket, figure 10c shows a bottom view of the box, figure 10d showing a sectional view in the axis marked 7, and figure 10e showing the detail in the area marked 8. In this example, bracket 62b is molded in place during the molding process. Bracket 62b might be made of any stiff, strong and temperature insensitive material, for example steel, aluminum, brass, wood, carbon fiber, or other metal alloy or composite material, that withstands the temperatures of the plastic molding process and provides the desired reinforcement. Bracket 62b is placed in appropriate position inside the electrical box mold at the

time the plastic part of the box is fabricated, the plastic generally encompassing or surrounding the bracket sufficiently to hold the bracket in place so that it does not become dislodged through ordinary use. Additional thicknesses of plastic material may be fashioned at the points of stress, for example 66 where bracket 62b meets the sidewall of the box and more particularly 65 where bracket meets the top of the box. Electrical box 60c is considered to be a "new work" type box.

[0022] Figures 11a and 11b show an alternate electrical box 60d similar to the box 60c of figure 10, with figures 11a and 11b showing two different perspective views to the interior of the box. Electrical box 60d has the same insert molded bracket 62b as box 60a of figure 10, but omits flanges 61. This box may also be installed in a similar manner to the box 40a of figure 6, and is considered to be an "old work" type box. Now the above described boxes may include alignment features, such as tabs, to align the electrical box into proper position with respect to the ceiling surface, particularly if the boxes are intended for old-work installations.

[0023] Figures 12a, 12b, and 12c show an alternate configuration of a reinforcing bracket 11b, including figures 12a and 12c showing perspective views and figure 12b showing a side view. This bracket 11b includes a substantially flat surface 12b for mating with the top of an electrical box. Mating surfaces 13b and 14b are provided to rest against an electrical box sidewall, that sidewall preferably being flat. Two legs 15b extend between mating surfaces 13b and 14b connecting the bracket portion including mating surface 12b with the bracket portions containing fastener features 16b. A separation 19 is provided between the two legs 15b to permit mounting around an obstruction in the electrical box, for example a screw boss. The compressive portion of this bracket 11b is small, and is mainly around the bend at 13b. Because of this, this bracket is preferably constructed of stiffer and/or stronger materials than that of 11a to maintain a similar bracing capacity.

[0024] Figures 13a, 13b and 13c show another alternate configuration of a reinforcing bracket of the type of 11a, figures 13a and 13c showing perspective views and 13b a side view. Bracket 11c includes a top mating interface 12c, fastener features 16c, and a strut portion 15c. This bracket is intended to fit an electrical box having a substantial cylindrical sidewall, for example the 3 inch ceiling electrical box shown in figures 3a-c, and thus curved regions 13ca and 14ca are provided to mate thereto. Side interface areas 13cb and 14cb may be used to mate to a fastener boss, as in the bracket of 11a. Bends 17c and 18c are included to orient strut portion 15c, top mating surface 12c, and side interface areas 13ca, 13cb, 14ca and 14cb in positions that will mate well with the intended electrical boxes, provide reinforcement and orient fastener features in a direction that assists the insertion of fasteners therein into a structural member. Bracket 11c may be made using similar methods and materials as to that of bracket 11a.

VERSION OF AMENDMENTS TO THE SPECIFICATION SHOWING CHANGES:

The changes of the new paragraphs from the old are noted below using strikethrough and/or brackets:

[0009] Figures 1a, 1b and 1c (herein after referred to as figure 1) show an exemplary reinforcement bracket.

Figures 2a, 2b and 2c show a four inch plastic electrical box with the bracket of figure 1 installed.

Figures 3a, 3b and 3c show a three inch plastic electrical box with the bracket of figure 1 installed.

Figures 4a, 4b and 4c show a three inch metallic electrical box with the bracket of figure 1 installed.

Figures 5a, 5b and 5c show an installation of two identical brackets into two types of electrical boxes.

Figures 6a, 6b, 6c and 6d show an exemplary electrical box with built-in reinforcement.

Figure 7 shows an alternate bracing electrical box with three flanges.

Figures 8a, 8b, 8c and 8d show an exemplary electrical box having flanges and an integrated bracket.

Figures 9a and 9b show an alternate electrical box having reinforcement.

Figures 10a, 10b, 10c, 10d and 10e show another exemplary electrical box with flanges and an insert molded reinforcement.

Figures 11a and 11b show another exemplary reinforced electrical box.

Figures 12a, 12b and 12c show an alternate reinforcing bracket.

Figures 13a, 13b and 13c show an additional alternate reinforcing bracket.

[0006] Now there are several electrical box types which will support a relatively heavy load, of which several are represented in U.S. patents. A usual type, represented by U.S. Patent No. 6,242,696 utilizes wings attached to the side of the electrical box to attach to a structural member. This type requires installation prior to the installation of a finished ceiling to avoid damage thereto. Another type, represented by U.S. Patent Nos. RE 38,120, 6,107,568, 6,191,362, 6,207,897 and 6,355,883 envisions a ceiling electrical box that attaches to an overhead structural support member from underneath through the use of screws or other fasteners generally driven upward through the top of the box and into the structural member. Those boxes either include a slot fitting the support member, or are designed to fit in a space between the support member and the surface of the finished ceiling. All of those designs have the disadvantage of reduced internal box volume, by which the number of electrical connections and wires is restricted over a common side-mounted nailed electrical box. Another type, represented by U.S. Patent Nos. RE 33,147, 6,098,945, 6,465,736, and 6,595,479 utilizes an extendable rod or other structure fittable between the space between two joists or structural members. This type of electrical box, although avoiding impacts into the volume of the electrical box, carries a number of disadvantages. First, the use of the rod introduces a substantial lever arm; the rod must therefore be fairly heavy to avoid bowing under the fixture load. This type of box is typically constructed of steel or other metal, as the needed plastic supports would be very thick in comparison. These boxes tend are more complex and require more materials and building steps to fabricate. The cost of this type of box tends to be much higher to the end user. A final type, represented in U.S. Patent Nos. RE 34,603 and 6,100,469, utilizes fasteners through a metal electrical box sidewall into the adjacent structural member. This type relies on the strength of the sidewall to avoid the fastener head pulling through the sidewall material under ~~lead~~load, and is therefore unsuitable for plastic materials. Furthermore, this type relies on the box structure to resist a downward force, which may place strain on welds and joints. Additonally, fasteners driven in a substantially horizontal direction limit the amount of driving force that can be applied to the fastener and may make installation difficult without specialized tools. And none of these box types provide a method of upgrading a ceiling electrical box to carry additional load.

[0011] Disclosed herein are several brackets useful for reinforcing electrical boxes installed adjacent to a structural member, such as a truss or joist. Shown in figures 1a, 1b and 1c (herein after figure 1)~~figure 1~~ is an example of one particular reinforcment device in the form of a bracket designed for two specific electrical box types, although it might be installed in others. Bracket 11a includes two largely planar portions, 12a and 15a, connected by bend 17a. Planar portion 12a, in this example, forms an interface providing a mating to the top of an electrical box at the inside. The ends of planar portions 12a and 15a are shaped to form an interface to the side of an electrical box at the inside, that interface being shown at 13a and 14a. In this example, ends 13a and 14a provide two interfaces for two specific electrical box types, as will be discussed presently, one interface provided at 13aa and 14aa for a substantially flat electrical box sidewall and another interface at 13ab and 14ab for a screw boss, which are integral in many plastic electrical ceiling boxes. Planar portion 15a provides a strut-like portion providing resistance to a compressive force applied between the top and side interfaces. That strut-like portion functions to at least partially convert a downward force on the electrical box to a horizontal force in the direction of the structural member. In bracket 11a, two fastener features, in this example recesses, 16aa and 16ab (shown 16a in fig. 1b) provide attachment points for screws. Recesses 16aa and 16ab are oriented so that fasteners inserted therein may fasten the bracket 11a through the electrical box sidewall and into an adjacent structural member. In this example, recesses 16aa and 16ab are configured to align fasteners at approximately 60 degrees from the vertical for an electrical box mounted to a vertical structural member surface. This permits the fasteners to be driven into the structural member with a single tool, such as an ordinary screwdriver or hammer, through many electrical box openings. It is preferred that this angle and the position of any fastener features be set so as to permit ease of access to the fasteners using ordinary tools, although other angles or positions may be chosen without departing from the larger scope of the invention. Preferably, the driving force may be directly applied by a tool external to the electrical box, for example a screwdriver or hammer. Recesses 16aa and 16ab may include a substantially cylindrical portion, not shown, for guiding the fastener at a desired angle relative to the bracket. In this example,

recesses 16aa and 16ab provide seats for screws, which recesses are not threaded to provide free movement so that bracket 11a may be brought tightly into a supportive position. A bend 18a is provided near end 14a to orient that end perpendicular to the electrical box sidewall providing for transverse motion by which bracket 11a may be brought more snugly into a supportive position during installation of the bracket.

[0013] Shown in figures 2a, 2b and 2c (herein after figure 2) is a four inch plastic electrical box 20a with bracket 11a installed; figure 2a showing a perspective view through the electrical box opening, figure 2b showing a bottom view, and figure 2c showing a sectional view through axis 1. Electrical box 20a includes an aperture through which access is permitted to manipulate wires inserted into the electrical box and to make connections thereto. Electrical box 20a includes flanges 22a for holding nails 23 in a relative position whereby nails 23 may be driven into a support member to secure the box 20a into position. When bracket 11a is in installed position, top mating interface 12a (not shown) rests against the electrical box top inside surface 26a, while side interface 14aa resting against a flat portion 21a of electrical box sidewall. Screws 24 are driven through bracket 11a and sidewall 21a into the structural member to secure the bracket 11a into installed position.

[0014] Bracket 11a is designed to reinforce two particular box types. Figures 3a, 3b and 3c (herein after figure 3) shows a three inch plastic electrical box 20b with bracket 11a intalled therein, with figure 3a showing a perspective view through the electrical box opening; figure 3b showing a view looking at the bottom, and figure 3c showing a sectional view through axis 3. Electrical box 20b also includes flanges 22b for fastening the box 20b to a structural member by way of nails 23. For this box, the installation position of bracket 11a also brings top mating surface 12a (not shown) against electrical box top inside surface 26b. This electrical box 20b includes a boss 25b for insertion of a mounting screw, whereby a fixture may be attached to electrical box 20b. Bracket 11a rests against boss 20b at the side interfaces 14ab and optionally 13ab (not shown). Screws 24 are likewise driven through bracket 11a and sidewall 21b into the

structural member to secure the bracket 11a into installed position.

[0015] The design of bracket 11a permits use in metallic electrical boxes as well. In figures 4a, 4b and 4c a bracket 11a is shown installed into a 3 inch metal-type electrical box 20c, with figure 4a showing a view from the box bottom, figure 4b showing a sectional view through axis 2, and figure 4c showing a perspective view. This electrical box 20c includes alignment wings 22c with holes pre-formed to permit fastening to a structural member with nails, screws, or other fasteners. As in the plastic boxes, bracket 11a mates top mating surface 12a against the top of the electrical box 26c, and also mates side interface 14aa against electrical box sidewall 21c. To secure, screws 24 are driven through bracket 11a and sidewall 21c into the structural member, although pre-drilling of holes through sidewall 21c may be necessary if holes are not formed therein prior to installation.

[0016] Figures 5a, 5b and 5c further illustrates the installation of two brackets of the type shown in figure 1 using two electrical box types; figure 5a showing a view looking up through the bottom of the electrical boxes and at the ceiling, figure 5b showing a sectional view about the axis labeled 4, and figure 5c showing an inverted perspective view (turned upside down for ease of viewing). Ordinary and modern construction utilizes wood structural members, of which one member 30 is shown. Member 30 might be the lower portion of a truss, a joist, or other structural member upon which a ceiling is to be fashioned. Ordinary construction utilizes drywall 31 fastened by nails or screws to structural members, one screw 32 being shown. Also shown are a four inch plastic electrical box 26a of the type of figure 2 and one three inch plastic electrical box 26b of the type of figure 3. Both boxes 26a and 26b are normally installed prior to drywall application to structural member 30 through flanges, one 22b being shown, and nails 23. Drywall 31 is applied afterward, and holes cut therein to provide access to the interior of the electrical boxes. After drywall 31 is installed, access to structural member 30 may be restricted, particularly if there is little or no access space surrounding structural member 30. In other situations access may be inconvenient, for example where structural member 30 is the lower part of a truss

accessible through an attic or other space. A bracket 11a may be installed without direct access to structural member 30 through the interior of the box. The bracket 11a is inserted into the box and placed in proper mounting position, next to the electrical box sidewall adjacent to the structural member. Screws 24, or other fasteners, are then driven through the bracket 11a, the electrical box sidewall 21a or 21b and into the structural member 30. Figure 5b includes a cutout 33 area to show screw 24 clearly.

[0017] An electrical box may optionally have a reinforcing bracket built in. Figures 6a-d (herein after figure 6) show conceptually how this might be done in a metal-type box. Referring to figure 6a, an electrical box 40a is made in an intermediate stage, the box having a top 45, sides, and an unbent flap 41. Electrical box 40a may be fashioned from usual processes for electrical box manufacture, including stamping, pressing, punching, spot welding and other techniques. In this example and prior to this stage, fastener features 42 have been stamped prior to the next step. Those fastener features might be, for example, screw guides, nail guides, or conical or countersunk structures for securing a screw head. In that step, flap 41 is bent as shown in figure 6b, to form a brace 43 and a top interface portion 44 meeting with top 45. Now it is to be understood that this step may actually include several successive steps in which bends are progressively made to flap 41. Figure 6c also shows the completed configuration as seen through the bottom of the box. Figure 6d shows a sectional view through the axis labeled 5. Now although it is not shown, sidewall 46 is preferably pre-punched or drilled with holes for fasteners to pass through when inserted in 42, by which the installer may avoid drilling operations. This electrical box does not include wings or other extra-box support structures, but rather relies on the bracing structure formed by brace 43 and top interface portion 44 to stabilize the attachment of the electrical box 40b to a structural member. Preferably, at least three fastener features are included, as shown, in at least two axes to form a tri-point securement geometry. Electrical box 40b may be considered to be an "old work" or "rework" type box, as it may be conveniently installed to a finished ceiling. To do so, an installer would (1) find an attachable structural member, (2) cut a matching hole in the drywall, paneling, or other wall structure so the electrical

box may be positioned next to the structural member, (3) insert the box and (4) fasten the box to the structural member through fastener features 42.

[0019] Figures 8a, 8b, 8c and 8d (herein after figure 8) shows another bracing electrical box 60a having conventional flanges 61 and an integrated bracket 62a, figure 8a showing a perspective view of the box internal space, figure 8b shows a view of the outside of the box looking at the sidewall in adjacency to the bracket, figure 8c shows a bottom view of the box and figure 8d shows a sectional view in the axis marked 6. In this example, bracket 62a is molded out of plastic and integral to the structure of the electrical box. Ribbing 63 may be provided to resist the force applied by fasteners 64 when attached, while minimizing the amount of plastic material needed. This particular electrical box is useful for new installations where access to the structural member is not restricted.

[0020] Shown in figures 9a and 9b is an alternate electrical box 60b~~, with figures 9a and 9b~~ showing two different perspective views to the interior of the box. Electrical box 60b has the same integrated bracket 62a and ribbing 63 as box 60a of figure 8, but omits flanges 61. This box may be installed in a similar manner to the box 40a of figure 6, and is considered to be an "old work" type box.

[0021] Figures 10a, 10b, 10c, 10d and 10e (herein after figure 10) shows another bracing electrical box 60c having conventional flanges 61 and an insert molded bracket 62b, figure 10a showing a perspective view of the box internal space, figure 10b showing a view of the outside of the box looking at the sidewall in adjacency to the bracket, figure 10c shows a bottom view of the box, figure 10d showing a sectional view in the axis marked 7, and figure 10e showing the detail in the area marked 8. In this example, bracket 62b is molded in place during the molding process. Bracket 62b might be made of any stiff, strong and temperature insensitive material, for example steel, aluminum, brass, wood, carbon fiber, or other metal alloy or composite material, that withstands the temperatures of the plastic molding process and provides the desired

reinforcement. Bracket 62b is placed in appropriate position inside the electrical box mold at the time the plastic part of the box is fabricated, the plastic generally encompassing or surrounding the bracket sufficiently to hold the bracket in place so that it does not become dislodged through ordinary use. Additional thicknesses of plastic material may be fashioned at the points of stress, for example 66 where bracket 62b meets the sidewall of the box and more particularly 65 where bracket meets the top of the box. Electrical box 60c is considered to be a "new work" type box.

[0022] Figures 11a and 11b shows an alternate electrical box 60d similar to the box 60c of figure 10, with figures ~~10a and 10b~~ 11a and 11b showing two different perspective views to the interior of the box. Electrical box 60d has the same insert molded bracket 62b as box 60a of figure 10, but omits flanges 61. This box may also be installed in a similar manner to the box 40a of figure 6, and is considered to be an "old work" type box. Now the above described boxes may include alignment features, such as tabs, to align the electrical box into proper position with respect to the ceiling surface, particularly if the boxes are intended for old-work installations.

[0023] Figures 12a, 12b, and 12c shows an alternate configuration of a reinforcing bracket 11b, including figures 12a and 12c showing perspective views and figure 12b showing a side view. This bracket 11b includes a substantially flat surface 12b for mating with the top of an electrical box. Mating surfaces 13b and 14b are provided to rest against an electrical box sidewall, that sidewall preferably being flat. Two legs 15b extend between mating surfaces 13b and 14b connecting the bracket portion including mating surface 12b with the bracket portions containing fastener features 16b. A separation 19 is provided between the two legs 15b to permit mounting around an obstruction in the electrical box, for example a screw boss. The compressive portion of this bracket 11b is small, and is mainly around the bend at 13b. Because of this, this bracket is preferably constructed of stiffer and/or stronger materials than that of 11a to maintain a similar bracing capacity.

[0024] Figures 13a, 13b and 13c shows another alternate configuration of a reinforcing bracket

of the type of 11a, figures 13a and 13c showing perspective views and 13b a side view. Bracket 11c includes a top mating interface 12c, fastener features 16c, and a strut portion 15c. This bracket is intended to fit an electrical box having a substantial cylindrical sidewall, for example the 3 inch ceiling electrical box shown in figures 3a-c, and thus curved regions 13ca and 14ca are provided to mate thereto. Side interface areas 13cb and 14cb may be used to mate to a fastener boss, as in the bracket of 11a. Bends 17c and 18c are included to orient strut portion 15c, top mating surface 12c, and side interface areas 13ca, 13cb, 14ca and 14cb in positions that will mate well with the intended electrical boxes, provide reinforcement and orient fastener features in a direction that assists the insertion of fasteners therein into a structural member. Bracket 11c may be made using similar methods and materials as to that of bracket 11a.